CLAIMS

WE CLAIM:

1. A system for projecting an image onto a surface, comprising:

at least two light beams;

at least two optical fibers, each of at least two of said optical fibers adapted to emit at least one of the light beams from an emitting end thereof;

a scanner to direct at least two of the light beams emitted from the emitting ends of the optical fibers to substantially simultaneously illuminate desired different dot locations on the viewing surface.

2. The system as in claim 1 wherein said scanner is a raster scanner.

3. The system as in claim 1 wherein at least two of said light beams are modulated.

4. The system of claim 1 wherein at least two of the light beams are of substantially the same wavelength.

5. The system of claim 1 wherein at least two of the light beams are of substantially different wavelengths.

6. The system of claim 5 wherein at least two of the different wavelengths each approximate one of the primary colors.

7. The system of claim 5 or 6 wherein at least two of the light beams are of substantially the same wavelength.

8. The system of claim 1, 2, 3, 4, 5 or 6 wherein said scanner is movable during at least one scan pass of a desired duration to direct the light beams to illuminate separate locations along at least one desired scan path along said viewing surface.

9. The system of claim 8 wherein said emitting ends and said scanner are configured such that during at least one scan pass at least two of the light beams illuminate substantially the same dot locations along the same scan path on the viewing surface at different times.

10. The system of claim 8 wherein said emitting ends and said scanner are configured such that during at least one scan pass at least two of the light beams illuminate locations along at least two separate scan paths on the viewing surface.

11. The system of claim 9 wherein said scanner is further movable during at least one frame pass of a desired duration to direct the light beams in a direction transverse of the scan paths between the beginning of at least two scan passes such that at least two different scan paths are illuminated during different scan passes.

12. The system of claim 11 wherein the movement of said scanner in the direction transverse of the scan path is substantially continuous during a scan pass.

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13. The system of claim 12 wherein said emitting ends and said scanner are configured such that during at least one scan pass at least two of the light beams illuminate substantially the same dot locations along the same scan path on the viewing surface at different times.

14. The system of claim 1 further comprising at least one focusing optic positioned to focus at least two of such light beams simultaneously.

15. The system of claim 14 wherein said at least one focusing optic is a single optic.

16. The system of claim 14 wherein said at least one focusing optic focusses the light beams through said scanner in a two-dimensional pattern of spots on the viewing surface corresponding to the configuration of the emitting ends.

17. The system of claim 1 wherein the number of fiber ends into which light beams are inserted equals the number of emitting ends from which such light beams are emitted.

18. The system of claim 1 wherein the number of fiber ends into which light beams are inserted differs from the number of emitting ends from which such light beams are emitted.

19. The system of claim 1 wherein at least two of said light beams are emitted from one of said emitting ends as a combined beam.

20. The system of claim 1, 4, 5, 6, 9, 10, 11, 12, 14, 15, 16, 17 or 18 wherein at least one of said light beams is inserted into at least one of said optical fibers.

21. The system of claim 20 wherein at least two of said light beams are emitted from one of said emitting ends as a combined beam.

22. The system as in claim 20 wherein at least two of said light beams are unmodulated when inserted into said fibers.

23. The system of claim 22 wherein at least two of such unmodulated light beams are combined using a fiber-based beam coupler into at least one of said fibers.

24. The system of claim 23 wherein the combined unmodulated light beam within said one at least one optical fiber is combined with at least one light beam in at least one other optical fiber.

25. The system of claim 23 wherein at least one of such unmodulated light beams is divided using a fiber-based beam coupler into at least two unmodulated light beams.

26. The system of claim 25 wherein at least one of the divided unmodulated light beams is divided to form at least two additional unmodulated light beams.

27. The system of claim 22 wherein said unmodulated beams are modulated prior to being directed to the viewing surface by said scanner.

28. A system for projecting an image onto a surface, comprising:

at least two light beams;

at least two optical fibers, each of at least two of said optical fibers adapted to emit at least one of the light beams from an emitting end thereof;

a scanner adapted to direct at least two of the light beams emitted from the emitting ends of the optical fibers to substantially simultaneously illuminate desired different dot locations along at least two separate scan paths on the viewing surface during at least one scan pass.

29. The system of claim 28 wherein said scanner is further movable during at least one frame pass of a desired duration to direct the light beams in a direction transverse of the scan paths between the beginning of at least two scan passes such that at least two different scan paths are illuminated during different scan passes.

30. The system of claim 29 wherein the movement of said scanner in the direction transverse of the scan path is substantially continuous during a scan pass.

31. The system of claim 28 wherein said emitting ends and said scanner are configured such that during at least one scan pass at least two of the light beams illuminate substantially the same dot locations along the same scan path on the viewing surface at different times.

32. The system of claim 31 wherein said scanner is further movable during at least one frame pass of a desired duration to

direct the light beams in a direction transverse of the scan paths between the beginning of at least two scan passes such that at least two different scan paths are illuminated during different scan passes.

33. The system of claim 32 wherein the movement of said scanner in the direction transverse of the scan path is substantially continuous during a scan pass.

34. The system of claim 33 wherein the number of fiber ends into which light beams are inserted equals the number of emitting ends from which such light beams are emitted.

35. The system of claim 34 wherein the number of fiber ends into which light beams are inserted differs from the number of emitting ends from which such light beams are emitted.

36. The system of claim 34 wherein at least two of said light beams are emitted from one of said emitting ends as a combined beam.

37. The system of claim 28, 29, 30, 31, 32, 33 or 34 further comprising at least one focusing optic positioned to focus at least two of such light beams simultaneously.

38. The system of claim 37 wherein said at least one focusing optic is positioned between the emitting ends and the scanner.

39. The system of claim 37 wherein said at least one focusing optic is a single optic.

40. The system of claim 37 wherein said at least one focusing optic focusses the light beams through said scanner in a two-dimensional pattern of spots on the viewing surface corresponding to the configuration of the emitting ends.

41. The system of claim 37 wherein said at least one focusing optic includes an achromat lens.

42. A system for projecting an image onto a surface, comprising:

at least two light beams;

at least two optical fibers, each of at least two of said optical fibers adapted to emit at least one of the light beams from an emitting end thereof;

a scanner to direct at least two of the light beams emitted from the emitting ends of the optical fibers to substantially simultaneously illuminate desired different dot locations on the viewing surface;

at least one focusing optic positioned to focus at least two of such emitted light beams simultaneously.

43. The system of claim 42 wherein at least two of said light beams are emitted from one of said emitting ends as a combined beam.

44. The system of claim 42 wherein said at least one focusing optic is positioned between the emitting ends and the scanner.

45. The system of claim 42 wherein said at least one focusing optic is a single optic.

46. The system of claim 42 wherein said at least one focusing optic focusses the light beams through said scanner in a two-dimensional pattern of spots on the viewing surface corresponding to the configuration of the emitting ends.

47. The system of claim 42 wherein said at least one focusing optic includes a mirror.

48. The system of claim 42 wherein said at least one focusing optic includes a holographic element.

49. The system of claim 42 wherein said at least one focusing optic includes a lens.

50. The system of claim 49 wherein said lens is an achromat.

51. A system for projecting an image onto a surface, comprising:

at least one source of at least two light beams;

at least one modulator for modulating at least one of such light beams;

at least two optical fibers;

at least one inserter adapted to insert at least one of the light beams from said at least one source into at least one of said optical fibers;

each of at least two of said optical fibers adapted to emit at least one of the light beams from an emitting end thereof;

a scanner adapted to direct at least two of the light beams emitted from the emitting ends of said optical fibers to substantially simultaneously illuminate desired different dot locations on the viewing surface, said scanner further including

a line scanning component adapted to simultaneously traverse the at least two directed light beams during at least one scan pass to illuminate dot locations along separate desired scan paths, and

a frame scanning component adapted to reorient the at least two light directed light beams between the initiation of at least two successive scan passes in a direction transverse of the scan paths of such scan passes, such that the light beams illuminate different desired scan paths during each of the at least two successive scan passes.

52. The system of claim 51 wherein the movement of said scanner in the direction transverse of the scan path is substantially continuous during a scan pass.

53. The system of claim 51 further comprising at least one focusing optic positioned to focus at least two of such light beams simultaneously.

54. The system of claim 53 wherein said at least one focusing optic is positioned between the emitting ends and the scanner.

55. The system of claim 53 wherein said at least one focusing optic is a single optic.

56. The system of claim 53 wherein said at least one focusing optic focusses the light beams through said scanner in a two-dimensional pattern of spots on the viewing surface corresponding to the configuration of the emitting ends.

57. The system of claim 53 wherein said at least one focusing optic includes a lens.

58. The system of claim 57 wherein said lens is an achromat.

59. The system of claim 51 wherein the number of fiber ends into which light beams are inserted equals the number of emitting ends from which such light beams are emitted.

60. The system of claim 51 wherein the number of fiber ends into which light beams are inserted differs from the number of emitting ends from which such light beams are emitted.

61. The system of claim 51 wherein at least two of said light beams are emitted from one of said emitting ends as a combined beam.

62. A system for projecting an image onto a viewing surface, comprising:

at least two light beams,

a scanner to direct at least two of the light beams onto the viewing surface to form a pattern of at least two spots at desired dot locations of a two-dimensional array of desired potential dot locations on the viewing surface to be illuminated during a frame pass, said scanner being further adapted to traverse the directed light beams such that the spots of the pattern of spots illuminate at least two substantially separate lines of dot locations of such array of dot locations on the viewing surface during each of a succession of scan passes during such frame pass, wherein at substantially the same time during at least one scan pass of such frame pass, at least one spot of the pattern of spots illuminates a dot location of such array that is not adjacent to the dot location illuminated by any other spot of the pattern of spots.

63. The system of claim 62 wherein such light beams are directed by the scanner such that at substantially the same time during at least one scan pass, at least one spot of the pattern of spots illuminates a dot location of such array that is not adjacent to the dot location in the same line of dot locations illuminated by any other spot of the pattern of spots.

64. The system as in claim 62 wherein at substantially the same time during at least one scan pass, at least one spot of the pattern of spots illuminates a dot location of such array that is not adjacent to the dot location in a different line of dot locations illuminated by any other spot of the pattern of spots.

65. The system of claim 64 wherein such light beams are directed by the scanner such that at substantially the same time during at least one scan pass, at least one spot of the pattern of spots illuminates a dot location of such array that is not adjacent to the dot location in the same line of dot locations illuminated by any other spot of the pattern of spots.

66. The system of claim 62 wherein at least three of such light beams are in a positional configuration with respect to each other and collectively directed to the viewing surface by said scanner such that the pattern of spots on said viewing surface is two-dimensional.

67. The system of claim 66 wherein the pattern of spots on the viewing surface corresponds to the configuration of the light beams.

68. The system of claim 62 wherein during a frame pass at least one spot scanned to illuminate at least one line of dot locations during one scan pass of such frame pass is not scanned to illuminate any line of dot locations adjacent to such one line of dot locations during any other scan pass of such frame pass.

69. The system of claim 62 wherein said scanner is a raster scanner.

70. The system of claim 62 wherein the pattern of spots is swept during a scan pass by a single scanning section.

71. The system of claim 62 wherein at some time during a scan pass at least one line is incomplete while another line is complete.

72. A system for projecting an image onto a viewing surface, comprising:

at least three light beams,

a scanner to direct at least three of the light beams onto the viewing surface to form a two-dimensional pattern of at least three spots at desired dot locations of a two-dimensional array of desired potential dot locations on the viewing surface to be illuminated during a frame pass, said scanner being further adapted to traverse the directed light beams such that the spots of the pattern of spots illuminate at least two substantially separate lines of dot locations of such array of dot locations on the viewing surface during each of a succession of scan passes during such frame pass, wherein at substantially the same time during at least one scan pass of such frame pass, at least one spot of the pattern of spots illuminates a dot location of such array that is not adjacent to the dot location illuminated by any other spot of the pattern of spots.

73. The system of claim 72 wherein the pattern of spots on the viewing surface corresponds to the configuration of the light beams.

74. The system of claim 72 wherein during a frame pass at least one spot scanned to illuminate at least one line of dot locations during one scan pass of such frame pass is not scanned to illuminate any line of dot locations adjacent to

such one line of dot locations during any other scan pass of such frame pass.

75. The system of claim 72 wherein said scanner is a raster scanner.

76. The system of claim 72 wherein the pattern of spots is swept during a scan pass by a single scanning section.

77. The system of claim 72 wherein at some time during a scan pass at least one line is incomplete while another line is complete.

78. The system of claim 72, further comprising:

a modulator adapted to modulate each light beam directed by said scanner to the viewing surface.

an input signal having intensity and color values for pixels of each frame corresponding to the desired dot locations on the viewing surface; and

a controller adapted to initiate the illumination of a dot location on the viewing surface by releasing a modulation signal to the modulator for a selected light beam at a time during an applicable scan pass of a frame pass to produce a spot of a desired color and intensity;

said controller further adapted to order the intensity and color values of the input signal for each frame to release the modulation signal when the scanner directs a beam of the light beams to illuminate a spot at a dot location corresponding to a pixel position in the input signal.

79. The system claimed in claim 78 wherein said controller is further adapted to cause the illumination of a location along at least one line of dot locations with a spot corresponding to the intensity and color value of the input signal, and to cause the illumination of the same location with another light beam directed along the same line at a different time.

80. The system of claim 72 or 78 wherein movement of the pattern of spots in the frame direction is substantially continuous during scan passes.

81. The system of claim 72 wherein at least two of the spots of the pattern of spots illuminating dot locations along at least one of the lines of dot locations during at least one scan pass are of substantially the same wavelength.

82. The system of claim 72 wherein at least two of the spots of the pattern of spots illuminating at least one of the lines of dot locations during at least one scan pass are of substantially different wavelengths.

83. The system of claim 72 wherein at least two of the light beams are directed to the viewing surface by said scanner such that the pattern of spots has at least two rows of at least one spot per row, and the spots of each row illuminate locations along a different line of dot locations on the viewing surface.

84. The system of claim 83 wherein at least three of the light beams are directed to the viewing surface by said scanner

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such that the pattern of spots has at least three rows of at least one spot per row.

85. The system of claim 83 wherein at least four of the light beams are directed to the viewing surface by said scanner such that the pattern of spots has at least four rows of at least one spot per row.

86. The system of claim 83 wherein at least twelve of the light beams are directed to the viewing surface by said scanner such that the pattern of spots has at least twelve rows of at least one spot per row.

87. The system of claim 72 wherein at least four of the light beams are directed to the viewing surface by said scanner such that the pattern of spots has at least two rows of at least two spots per row, and the spots of each row illuminate a plurality of the same locations along at least one separate line of dot locations on the viewing surface at different times.

88. The system of claim 87 wherein at least twelve of the light beams are directed to the viewing surface by said scanner such that the pattern of spots has at least four rows of at least three spots per row.

89. The system of claim 87 wherein at least sixteen of the light beams are directed to the viewing surface by said scanner such that the pattern of spots has at least four rows of at least four spots per row.

90. A method for illuminating a plurality of dot locations of a two-dimensional array of desired potential dot locations on a viewing surface, comprising the steps of:

illuminating each of at least two desired non-adjacent dot locations of such array at substantially the same time with at least one spot of a pattern of spots;

sweeping such pattern of spots in a line direction along at least two different lines of desired dot locations of such array on the viewing surface during a scan pass;

adjusting the position of the pattern of spots on the viewing surface in a frame direction transverse of the line direction; and

repeating the sweeping and adjusting steps a desired number of times to write a frame.

91. The method of claim 90 wherein at least one spot of the pattern of spots illuminates a dot location of such array that is not adjacent to the dot location in the same line of dot locations illuminated by any other spot of the pattern of spots.

92. The method of claim 90 wherein at least one spot of the pattern of spots illuminates a dot location of such array that is not adjacent to the dot location in a different line of dot locations illuminated by any other spot of the pattern of spots.

93. The method of claim 92 wherein at least one spot of the pattern of spots illuminates a dot location of such array that is not adjacent to the dot location in the same line of

dot locations illuminated by any other spot of the pattern of spots.

94. The method of claim 90, 91, 92 or 93 wherein the pattern of spots is two-dimensional on said viewing surface.

95. The method of claim 90 wherein during at least one sweeping step at least one spot of the pattern of spots does not illuminate any dot location in at least one line of dot locations that is adjacent to another line of dot locations illuminated by such spot during the same frame.

96. The method of claim 90 wherein said adjusting step is substantially continuous during substantially all sweeping steps of a frame.

97. The method of claim 90 wherein at some time during a scan pass all dot locations in at least one line of dot locations have not been completely illuminated by at least one spot while all dot locations in another line of dot locations have been illuminated by at least one other spot.

98. The method of claim 90 wherein during the sweeping step at least two of the spots swept along at least one line of dot locations are of substantially different wavelengths.

99. The method of claim 90 wherein during the sweeping step at least two of the spots swept along at least one line of dot locations are of substantially the same wavelengths.

100. The method of claim 90 wherein at least one of the sweeping steps during a frame further comprises:

sweeping at least one spot of the pattern of spots along at least one line of dot locations on the viewing surface that is located between at least two lines of dot locations on the viewing surface that were swept by at least one spot of the pattern of spots during prior sweeping steps during the writing of the frame.

101. The method of claim 90 wherein all lines of desired dot locations on the viewing surface are illuminated by at least one spot of the pattern of spots during the writing of the frame.

102. The method of claim 90 wherein during at least one sweeping step of a frame at least one of the spots of the pattern of spots substantially overwrites at least one dot location of a line of dot locations swept by another of said spots of the pattern of spots during the same or another sweeping step.

103. The method of claim 90 wherein during at least one sweeping step of a frame at least one of the spots of the pattern of spots substantially overwrites at least one dot location of a line of dot locations swept by at least two other spots of the pattern of spots during at least two other and/or same sweeping steps.

104. The method of claim 102 or 103 wherein the spot overwriting such dot location has a substantially different

wavelength than the spot illuminating such dot location during another sweeping step.

105. The method of claim 102 or 103 wherein the spot overwriting such dot location has substantially the same wavelength than the spot illuminating such dot location during the same sweeping step.

106. The method of claim 90 wherein during each adjusting step, the spots of the pattern of spots are moved in the frame direction a number of adjacent lines of dot locations on the viewing surface for a frame that is substantially equal to the number of lines of dot locations illuminated by the spots of the pattern of spots during a majority of the sweeping steps during such frame.

107. The method of claim 106 wherein the number of adjacent lines of dot locations on the viewing surface is substantially equal to an integer multiple of the number of lines of dot locations illuminated by the spots of the pattern of spots during a majority of the sweeping steps during such frame.

108. The method of claim 90, 91, 92, 93, 96, 100, 101 or 102, further comprising the step of:

varying the adjustment of the position of the pattern of spots in the frame direction during the adjusting step to compensate for differences in the location of the pattern of spots for different sweeping steps.

109. A method for projecting an image onto a viewing surface, comprising the steps of:

emitting at least two light beams;

focusing the emitted light beams simultaneously with a focussing optic;

illuminating each of at least two desired dot locations on the viewing surface at substantially the same time with at least one of the light beams.

110. The method of claim 109, further comprising the step of:

sweeping such focussed light beams in a line direction to substantially simultaneously illuminate at least two different lines of desired dot locations on the viewing surface during a scan pass;

adjusting the position of the focussed light beams in a frame direction transverse of the line direction to reposition the lines of desired dot locations to be illuminated during a successive scan pass; and

repeating the sweeping and adjusting steps a desired number of times to write a frame of spaced illuminated lines.

111. The method of claim 110, further comprising the step of:

varying the adjustment of the position of the pattern of spots in the frame direction during the adjusting step to compensate for differences in the location of the pattern of spots for different sweeping steps.

112. A system for projecting an image onto a surface, comprising:

at least two light beams;

at least two optical fibers, at least one of said optical fibers adapted to emit at least one of the light beams from at least one emitting end thereof;

a scanner to direct at least two of the light beams emitted from the emitting ends of the optical fibers to substantially simultaneously illuminate desired different dot locations on the viewing surface.

113. The system of claim 112 wherein at least two of the light beams are emitted from a single emitting end.

114. The system of claim 112 wherein at least one of such light beams is modulated.

115. The system of claim 112 wherein at least one of such light beams is unmodulated.

116. The system of claim 112 wherein all of such light beams are modulated prior to being directed to the viewing surface by said scanner.

117. The system of claim 112, further comprising:

at least three of such light beams;

at least three of such optical fibers adapted to emit at least three of the beams from at least two emitting ends thereof.

118. A system for projecting an image onto a surface, comprising:

at least one light beam;

at least two optical fibers, each adapted to conduct at least one of the light beams;

at least one fiber-based beam coupler positioned to divide the at least one light beam conducted by at least one optical fiber into at least one light beam conducted by two separate optical fibers;

each of at least two of said optical fibers adapted to emit the at least one light beams from an emitting end thereof;

a scanner to direct at least two of the emitted light beams to substantially simultaneously illuminate desired different dot locations on the viewing surface.

119. The system of claim 118 wherein the combined light beam within said at least one optical fiber is combined with a light beam in at least one other optical fiber to form another combined light beam.

120. The system of claim 118 wherein at least two of the light beams are emitted from a single emitting end.

121. The system of claim 118 wherein at least one of such light beams is modulated.

122. The system of claim 118 wherein at least one of such light beams is unmodulated.

123. The system of claim 118 wherein all of such light beams are modulated prior to being directed to the viewing surface by said scanner.

124. The system of claim 118, further comprising:

at least three of such light beams;

at least three of such optical fibers adapted to emit at least three of the beams from at least two emitting ends thereof.

125. The system of claim 118 wherein at least one of the divided unmodulated light beams is divided to form at least two additional unmodulated light beams.

126. A system for projecting an image onto a surface, comprising:

at least two light beams;

at least two optical fibers, each adapted to conduct at least one of the light beams;

at least one fiber-based beam coupler positioned to combine the at least one light beam conducted by each of at least two optical fibers into at least one light beam conducted by one optical fibers;

each of at least one of said optical fibers adapted to emit the at least one light beams from an emitting end thereof;

a scanner to direct at least one of the emitted light beams to substantially simultaneously illuminate desired different dot locations on the viewing surface.

127. The system of claim 126 wherein the combined light beam within said at least one optical fiber is combined with a light beam in at least one other optical fiber to form another combined light beam.

128. The system of claim 126 wherein the combined light beam within said at least one optical fiber is combined with a light beam in at least one other optical fiber to form another combined light beam.

129. The system of claim 126 wherein at least two of the light beams are emitted from a single emitting end.

130. The system of claim 126 wherein at least one of such light beams is modulated.

131. The system of claim 126 wherein at least one of such light beams is unmodulated.

132. The system of claim 126 wherein all of such light beams are modulated prior to being directed to the viewing surface by said scanner.

133. The system of claim 126, further comprising:

at least three of such light beams;

at least three of such optical fibers adapted to emit at least three of the beams from at least two emitting ends thereof.

134. A method for projecting an image onto a viewing surface, comprising the steps of:

conducting at least one light beam through each of at least one optical fiber;

dividing at least one light beam conducted through at least one optical fiber into at least two separate optical fibers;

emitting each of at least two of the light beams substantially simultaneously from an emitting end of an optical fiber;

directing at least two of the emitted light beams to desired different locations on the viewing surface, thereby

illuminating a pattern of spots at such desired locations on the viewing surface.

135. The method of claim 134 further comprising the steps of:

sweeping such pattern of spots in a line direction along at least two different lines of desired locations on the viewing surface during a scan pass;

adjusting the position of the pattern of spots in a frame direction transverse of the line direction between the initiation of successive scan passes; and

repeating the sweeping and adjusting steps a desired number of times to write a frame.

136. A method for projecting an image onto a viewing surface, comprising the steps of:

conducting at least two light beams through each of at least two optical fibers;

combining the light beams conducted through at least two optical fibers into one at least one light beam conducted through each of at least one optical fiber;

emitting each of the light beams substantially simultaneously from an emitting end of an optical fiber;

directing at least two of the emitted light beams to at least one desired location on the viewing surface, thereby

illuminating a pattern of spots at such desired locations on the viewing surface.

137. The method of claim 136 further comprising the steps of:

sweeping such pattern of spots in a line direction along at least two different lines of desired locations on the viewing surface during a scan pass;

adjusting the position of the pattern of spots in a frame direction transverse of the line direction between the initiation of successive scan passes; and

repeating the sweeping and adjusting steps a desired number of times to write a frame.

138. A method for projecting an image onto a viewing surface, comprising the steps of:

sweeping a pattern of spots in a line direction along a line of potential dot locations on the viewing surface during a plurality of successive scan passes; while

traversing the pattern of spots in a frame direction substantially transverse of the line of potential dot locations on the viewing surface;

adjusting the traverse of the pattern of spots between the initiation of each scan pass to account for pointing errors in the frame direction.

139. A method for projecting an image onto a viewing surface, comprising the steps of:

sweeping a pattern of spots in a line direction along a line of potential dot locations on the viewing surface;

traversing the pattern of spots in a frame direction substantially transverse of the line of potential dot locations on the viewing surface; then

repeating the sweeping and traversing steps a desired number of times while

adjusting the traverse of the pattern of spots in the frame direction between the initiation of each scan pass to compensate for differences in positioning of the pattern of spots on the viewing surface for different sweeping steps.

140. A method for projecting an image onto a viewing surface comprising the steps of:

detecting when a line scanner is in position to direct light beams to illuminate a dot location at the beginning of a row of potential dot locations on the viewing surface;

releasing image data corresponding to an initial pixel of a line of pixels responsive to the detecting step;

modulating a light beam to illuminate the dot location at the beginning of the row of potential dot locations with a spot of an intensity corresponding to the image data on the viewing surface responsive to the releasing step, thereby

ensuring accurate horizontal registration of the spot on the viewing surface.

141. The method of claim 140 further comprising the steps of:

line repeating the releasing, detecting and modulating steps for successive dot locations along the row of potential dot locations and corresponding image data pixel locations until the entire row of potential dot locations is illuminated with desired modulated spots.

142. The method of claim 141 further comprising the steps of:

frame repeating the releasing, detecting, modulating and line repeating steps a desired number of times; and

adjusting the direction of the light beams such that a different row of potential dot locations will be illuminated for each repetition of the releasing, detecting, modulating and line repeating steps.

143. The method of claim 142 wherein each of the releasing steps of each frame repeating step further comprise:

sampling for input pixel data release according to an output digital clock having a desired frequency.

144. The method of claim 143 wherein the initial releasing step of each frame repeating step further comprises:

sampling according to an input digital clock having a substantially higher than the output digital clock and

resetting the output digital clock to correlate with the input digital clock.

145. The method of claim 144 wherein at least one releasing step in addition to the initial releasing step of each frame repeating step further comprises:

sampling according to an input digital clock having a substantially higher than the output digital clock and

resetting the output digital clock to correlate with the input digital clock.

146. The method of claim 142 wherein the detecting step is performed by a facet detector adapted to determine when a leading portion of a mirror polygon facet is in position to direct light beams to the viewing surface.

147. The method of claim 142, 143, 144, 145 or 146 further comprising the steps of:

performing the frame repeating step for at least two rows of potential dot locations on the viewing surface.

148. The method of claim 147 wherein the initial releasing step for each row of potential dot locations by the output clock is synchronized with the input digital clock.

149. A method for ensuring accuracy in horizontal registration on a screen of the spots of a laser-based digital raster scanning projector wherein the initial spot of a line of spots, or the first-to-be-written spot of a pattern of spots, is released to a modulator or other device that triggers the writing of the spot, by a facet pulse detector that determines that the scanner is in the correct position to write.

150. The method of claim 149 wherein the receipt of the facet pulse is recognized in a digital environment by sampling according to a digital clock with a substantially faster clock rate than the pixel clock used to output image data.

151. The method of claim 150 wherein the faster clock is used to re-set, and thereby synchronize, the slower digital output pixel clock for use in releasing digital image data at a rate more suitable to the scanner system.

152. The method of claim 149, 150 or 151 where the projector system is a multi-line scanning system.

153. The method of claim 152 wherein any delay in releasing the first pixel of a line of a scan pass relative to the first pixel to be written by any line on that particular scan pass is measured according to a digital cloak substantially faster than the output clock.